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MAIL BRANCH



Aerotron-Repco Sales, Inc.

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May 27, 1993

JUN - 3 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Federal Communications Commission
Washington, D.C. 20554

In the matter of

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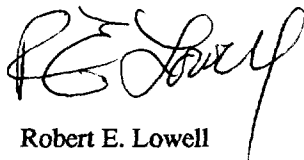
[REDACTED]

This industry has spawned new companies and new jobs with the potential for tremendous future growth. U. S. leadership in the wireless market promotes growth in both domestic and international markets. A change in the 90-2928 MHz band could destroy all end user confidence in the wireless voice and data industry and would deal a blow to U.S. leadership in this area.

Your support in this matter would be greatly appreciated.

Sincerely,

AEROTRON-REPCO SALES, INC.

A handwritten signature in black ink, appearing to read "RE Lowell", written in a cursive style.

Robert E. Lowell
Director, Marketing

NLR-96 Radio Modem

RS-232 Spread-Spectrum Radio Modem

902-928 MHz (unlicensed spread-spectrum frequencies) • 1 watt

The benefits of radio modems are
simple—they can save you time and



NLR-96 Specifications

RS-232 Spread-Spectrum Radio Modem

General

Operating frequencies	902-928 MHz (spread spectrum)
Interface	RS-232C compatible, DB-25 connector, selectable synchronous (internal clock) or asynchronous; optional RS-485/422 with RS-530 pinout
System operation	Point-to-point or multipoint (high-speed polling schemes)
RF channels	7 (half/full duplex)
Frequency control	Synthesized, DIP-switch programmable
RF power output	1 watt
I/O data rate:	
Asynchronous	9600, 4800, 2400, or 1200 bps (DIP-switch programmable)
Synchronous	9600 bps (internal clock only)
RF Data Rates	121 kbps
Bit error rate (-95 dBm)	Better than 1×10^{-5}
RTS/CTS delay	0 mS to 200 mS (8 selectable positions)
Operating modes	Half or full duplex (with time-domain multiplexing), master or slave mode selected by DIP switch
Synchronous clocking	Internal
Spurious bit suppression	Will not decode squelch noise that would cause "dribble bits"
Rx to Tx turnaround time	Approximatley 9 mS
Watchdog timer	To timeout or reset
Data synchronization	
scrambler	Standard feature
Operating temperature	-20° to +60° C
3-wire I/O	Modem will initiate Tx on first character ("turn-off" delay is selectable from 5-500 character intervals)
Antenna system	External flexible antenna (standard feature), connects to SMA connector

RF Performance Characteristics

Sensitivity	-95 dBm (typical)
1/2 channel rejection (3 MHz)	20 dBc (typical)
Adjacent channel rejection (6 MHz)	55 dBc (typical)
Alternate channel rejection (12 MHz)	60 dBc (typical)
Image rejection	40 dBc (typical)
Emissions outside 902-928 band:	
Receiver	Meets FCC part 15, class A
Transmitter	Meets FCC part 15.247 (spread spectrum)
Modulation bandwidth:	
-6 dBc	1.8 MHz (typical)
-40 dBc	4.2 MHz (typical)

NLR-96 (desktop enclosure)

Dimensions (height x width x depth)	2.2" x 10.0" x 11.7" (5.6 cm x 25.4 cm x 29.7 cm)
Weight (no duplexer)	7.6 lbs.
Power requirements	120/240 VAC with external 12 VDC battery backup capability
Indicators	DSR, DTR, DCD, RD, RTS, CTS, TD, Tx signal, RF Signal, Test
I/O connector	DB-25

NLQ-96 (utility enclosure)

Dimensions (height x width x depth)	3.0" x 6.4" x 11.5" (RFI enclosure) (7.6 cm x 16.3 cm x 29.2 cm)
Weight (no duplexer)	7.0 lbs.
Indicators	Internal on interface card
I/O connector	DB-25
Power requirements	12 VDC $\pm 10\%$

Specifications are subject to change without notice.

Repco products are distributed solely by:

ARS Aerotron-Repco Sales, Inc.

2400 Sand Lake Road • Orlando, Florida 32809-7666 • 407-856-1953 • Fax: 407-856-1960 • Telex: 441117REPCO UI • 1-800-950-5633

VoiceNet 2000R

Wireless Digital Voice Intercom System

902-928 MHz spread-spectrum operation (does not require an FCC license)

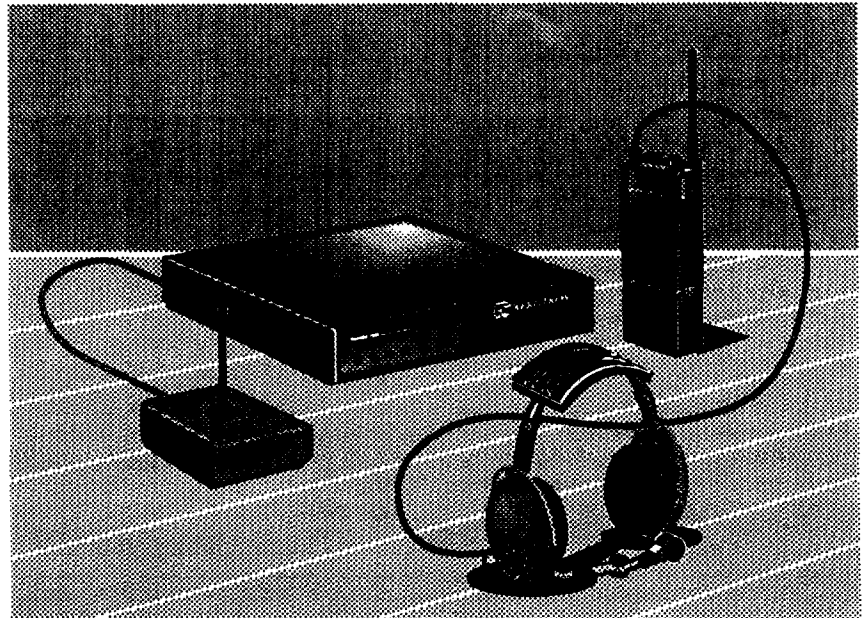
Designed specifically to meet the rigorous demands of the railroad user, the Aerotron VoiceNet 2000R is a unique wireless intercom system that provides local voice communication between crew members and can also be interconnected with a locomotive's long-range two-way radio system. Because it uses spread-spectrum radio and complies with FCC Part 15, the VoiceNet 2000R does not require an FCC site license to operate.

The heart of the digital VoiceNet 2000R system is a base station that is typically mounted inside the locomotive and connects to an externally mounted antenna. The base station can support up to four portable headset units, each providing hands-free, full-duplex communications within a 500 foot radius of the locomotive.

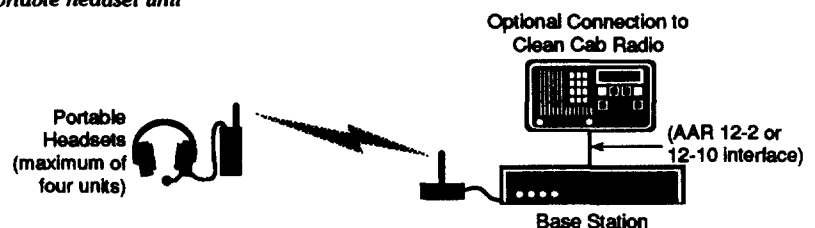
The system provides full-duplex communications, meaning that simultaneous two-way conversation is possible (like a telephone) and all members of the work group can hear and participate in any ongoing conversation. Since the headset is voice activated, no buttons must be pushed before talking.

By interfacing the base station unit with an Aerotron Alpha 1700 Clean Cab radio (or virtually any other radio), the intercom network can be linked to the locomotive's long-range FM radio system. To transmit over the Clean Cab radio, the headset user simply presses the headset unit's push-to-talk button, which remotely keys the Clean Cab radio. Incoming audio received by the Clean Cab radio is automatically heard by all headset users over the VoiceNet 2000R intercom system (but the intercom group conversation is not automatically transmitted over the Clean Cab radio). Any number of headset users can press their push-to-talk buttons at any one time.

The VoiceNet 2000R can be set to operate on one of seven different overlapping operating frequencies. Because they overlap, odd-numbered frequencies cannot be used in close proximity (500-1,000 feet) of even-numbered frequencies. A total of eight different squelch codes are also available to provide conversation (not RF) isolation.



VoiceNet 2000R base station, transceiver unit and portable headset unit



Major Features Include:

- Full-duplex, telephone-like conversations—voice-activated, hands-free operation
- An FCC license is not required for operation
- Meets AAR 12-2 and 12-10 clean cab interface standards and can also accommodate most other radio systems
- Typical portable-to-antenna range is 500 feet
- Ideal for high-noise environments
- Can be used to free dispatchers to move about office areas while maintaining control over the radio system
- Eight squelch codes for conversation isolation
- Frequency, squelch code and unit number are thumbwheel selectable
- Digital spread-spectrum communication prevents eavesdropping
- Supports a variety of headset types
- Rechargeable battery pack provides more than 9 hours of continuous operation
- Made in USA

VoiceNet 2000R Specifications

Wireless Digital Voice Intercom System

General

Frequency range	902-928 MHz (divided into seven overlapping bands)
Number of portable units	Up to 4 (full duplex)
RF power output	100 mW (maximum)
Typical range	500 foot radius from base station
Frequency control	Synthesized, thumbwheel selectable
Bit-error rate	Better than 1×10^{-5}
Sensitivity	-85 dBm (minimum at 1×10^{-5} BER)
Alternate channel rejection	60 dBc (typical)
Adjacent channel rejection	50 dBc (typical)
Image rejection	40 dBc (typical)
Modulation bandwidth:	
-6 dBc	3.6 MHz (typical)
-40 dBc	8.4 MHz (typical)
Receiver emissions	Meets FCC Part 15, Class A
Transmitter emissions	Meets FCC Part 15.247 (spread spectrum)
Licensing	No FCC site license is required to operate

FCC type acceptance
is pending.

Base Station

Power requirements	1.5 amps at 12 VDC
Dimensions	6.0 x 8.0 x 1.0 inches
Enclosure	Industrial-grade aluminum chassis (separate enclosure for radio transceiver)
Configuration	Frequency and squelch code are thumbwheel selectable
Interface	Meets AAR 12-2 and 12-10 interface standards and can also accommodate interface to most other radio systems
RF interconnect	Connects to a separate transceiver unit that contains all RF circuitry

Transceiver Unit

Interconnect	Hard wired to base station via cable with DB-15 connectors
Operating frequency	Seven overlapping channels (DIP switch selectable), even and

VoiceNet 2000

Wireless Digital Voice Communications Network

902-928 MHz spread-spectrum operation (does not require an FCC license)

The Repco VoiceNet 2000 is a unique wireless communications system that provides flexible, robust local voice communications for virtually any work group. And, because it uses spread-spectrum radio, no FCC site license is required to operate the system.

The heart of the digital VoiceNet 2000 system is a microprocessor-controlled base station with a floppy-disk drive that is used to load the customizable control software. The base station, which does not require an operator, is connected by wirelines (at distances of up to 1,000 feet) to as many as four remotely located transceiver units. Each transceiver unit, in turn, supports up to four portable handset units and can be configured to



Model 2000 Specifications

Wireless Digital Communications Network

General

Frequency range	902-928 MHz (divided into four 6 MHz bands)
Number of portable units	Up to 16 (full duplex)
RF power output	100 mW (maximum)
Typical range	500 foot radius around each remote radio cell
Frequency control	Synthesized, software programmable
Bit-error rate	Better than 1×10^{-5}
Sensitivity	-85 dBm (minimum at 1×10^{-5} BER)
Alternate channel rejection	60 dBc (typical)
Adjacent channel rejection	50 dBc (typical)
Image rejection	40 dBc (typical)
Modulation bandwidth:	
-6 dBc	3.6 MHz (typical)
-40 dBc	8.4 MHz (typical)
Receiver emissions	Meets FCC Part 15, Class A
Transmitter emissions	Meets FCC Part 15.247 (spread spectrum)
Licensing	No FCC site license is required to operate

FCC type acceptance
is pending.

Base Station

Analog interconnect	Interface with up to 16 telephone or intercom lines
Control software	Stored on floppy disks and read on power-up by an internal 3.5 in. floppy disk drive
Remote transceiver interface	Dual DB-15 connectors for each band permit connection of two same-frequency remote transceivers for improved coverage
Indicators	Power on/off, system ready, in-range/out-of-range for each portable
Power requirements	110/220 VAC
Dimensions	17.0 x 12.0 x 5.0 inches
Enclosure	Industrial-grade aluminum chassis

Remote Transceiver Units

Interconnect	Hard wired to base station via cable with DB-15 connectors
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